





Transparent and translucent oil-in water microemulsion for hair care

Patent number: EP0820758
Publication date: 1998-01-28
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Classification:
- international: A61K7/06; A61K7/00
- european: A61K7/06G16B; A61K8/06C
Application number: EP19970111504 19970708
Priority number(s): DE19961029951 19960725

Also published as: EP0820758 (A3)**Cited documents:** EP0490053
 DE2710468
 EP0270249**Abstract of EP0820758**

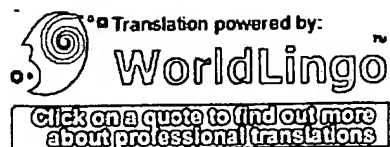
A hair cosmetic product formulation in the form of a transparent or translucent oil-in-water microemulsion comprises an oil phase and a water phase containing the following components:

(A) polyethoxylated oil-in-water emulsifier(s) (A1), propoxylated oil-in-water emulsifier(s) (A2) or polyethoxylated and poly-propoxylated oil-in-water emulsifier(s) (A3), or a mixture;

(B) optional further oil-in-water emulsifier(s); and

(C) cationic surfactant(s) which does not have film-forming properties.

Total emulsifier content in the emulsion is less than 2 wt.%.



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Description OF EP0820758

The available invention concerns cosmetic hair care preparing.

The available invention concerns hair-cosmetic active substance combinations and Preparing, such combinations containing. In particular those concerns available invention hair-cosmetic active substance combinations and preparing to the care of the hair and the scalp. In a preferential execution form the available invention concerns active substance combinations and preparing, for it serve, the individual hair for strong and/or the haartracht to lend altogether stop and abundance.

The human hair can be generalized, divided, roughly into that living part, the hair root, and the dead part, the hair shank. That Hair shank for his part consists of the Medulla, which however evolutionary causes for modern humans insignificantly become and regressed is and with thin hair is often completely missing, furthermore the Medulla enclosing Cortex and that the whole from Medulla and Cortex coating Cuticula.

In particular the Cuticula, in addition, the keratinoese range between Cuticula and Cortex as outer hull of the hair are special demand through Environmental influences, by combs and brushes, in addition, by hair treatment, in particular hair colouring and hair deformation, z.B. Continuous waving procedure, suspended.

In the case of particularly aggressive demand, for example bleaching also Oxidantien such as hydrogen peroxide, with which in the Cortex distributed Oxidative to be destroyed, also the inside of the hair knows pigments in To be pulled. Is human hair durably colored become, only oxidizing hair dyeing methods come into in practice Consideration. When oxidative hair coloring the training takes place of the Farbstoffchromophoren by reaction of Praekursoren (phenol, Aminophenole, more rarely also diamines) and Basen (mostly p-Phenylendiamin) with that Oxidizing agent, mostly hydrogen peroxide. Hydrogen peroxide concentrations around 6% thereby are usually used.

Usually is assumed apart from the coloring effect also one Bleaching effect by the hydrogen peroxide takes place. In oxidative colored, as with bleached hair, microscopic holes are similar to human hair in the places, in which Melaningranula were present, demonstrably. Fact is, that the oxidizing agent hydrogen peroxide not only with the color preliminary stages, sometimes but also with the hair substance react and one Damage of the hair to cause can.

Also the hair laundry with aggressive Tensiden can stress the hair, at least its appearance or the appearance of the haartracht lower altogether. For example certain water-soluble can Hair components (z.B. Urea, urine acid, xanthin, Keratin, Glycogen, Citronensaure, lactic acid) by the hair laundry to be out-lyed.

For these reasons for quite some time Haarpflegekosmetika are partly used, which are intended for it, after influencing from the hair again rinsed out too become, partly such, which are to remain on the hair. The latters can so it is formulated that they do not only serve the care of the individual hair, but also the appearance of the haartracht altogether improve, for example because they lend more abundance to the hair, the haartracht over one longer period fix or its combing barness improve.

The characteristic of the abundance is for example attributed to a hair-style, if the hair after the treatment on the scalp does not rest upon flat and well is combable.

The characteristic volumes is for example attributed to a hair-style, if the hair exhibits abundance and jump strength after the treatment.

The characteristic of the Body's is for example attributed to a hair-style, if the hair volume under external, disturbing influences remains large.

By quaternaere ammonium compounds for example the combing barness leaves itself the hair crucially improve. Such connections draw up on the hair and are often still provable after several hair laundry on the hair.

The state of the art it let lack however active substances and preparing, which sent the damaged hair in satisfying way care. Also proved preparing, which should give abundance to the haartracht, often as they were unsuitable insufficiently, at least, as hair care preparing to be used. The haartracht fixing preparing of the conditions that Viscose rayon components, which for example usually, contain technology The risk run to arouse a feeling of the tackness which often through skillful formulation to be compensated must.

Task was to create the disadvantages of the state of the art remedy.

Frequent manifestations of cosmetic or dermatologischer preparing are feindisperse multi-phase systems, in which one or more fat and/or. Oil phases beside one and/or. several water phases are present. Of these systems again the actual emulsions are at the furthest common.

In simple emulsions lie into phase a feindisperse, from one Emulsifying agent covering umschlossene droplets of the second phase (water droplet in W/O- or Lipidtröpfchen in O/W emulsions) forwards. The droplet diameters that usual emulsions lie within the range of approx. 1 μm to approx.. 50 μm . Such

EMI3.2

Macro emulsions

EMI3.1

are, without further coloring additives, milchigweissgefaerbt and opak. Finer one

EMR3.2 macro emulsions

EMR3.1, their droplet diameter within the range of approx.. 10<-1> μm to approx.. are appropriate for 1 μm , are again bluish without coloring additives, and obscurely.

Mizellaren and molecular solutions with particle diameters smaller than approx.. 10<-2> μm , is reserved, to appear clearly and transparency.

The droplet diameter of transparent and/or. transluzenten micro emulsions on the other hand lies within the range of for instance 10<-2> μm to for instance 10<-1> μm . Such micro emulsions are usually lowviscous. The viscosity of many is comparable to micro emulsions of the O/W type with that of the water.

Advantage from micro emulsions is that in the dispersen phase of active substances more finely dispers to be present can as in the dispersen phase of

EMR3.2 macro emulsions

EMR3.1. A further advantage is that it due to their low viscosity are sprayable. If micro emulsions are used as Kosmetika, draw appropriate products generally by high cosmetic elegance out.

At the micro emulsions of the state of the art it is unfavorable that always high content to one or more emulsifying agents to be used must, there those small droplet size a high boundary surface between the phases causes, which must be usually stabilized by emulsifying agents.

Actually the use of the usual cosmetic emulsifying agents is harmless. Nevertheless can emulsifying agents, like in the long run each chemical substance, in the single case allergische or reactions being-based on hypersensitivity of the user cause.

Like that it is well-known that determined Lichtdermatosen by certain emulsifying agents, but also by different fats, and simultaneous exposition of sunlight are released:

A special task of the available invention was it, feindisperse Preparing of the type oil in water with as low a one as possible To make available emulsifying agent content, which not the disadvantages of the State of the art and which exhibit for most diverse cosmetic and/or dermatologische applications, for example those first beschreibenen Uses to find can. A further task of the invention was, that limited offer preparing of the type oil in water, feindispersen on, of the To enrich state of the art.

It is actually well-known that hydrophilic emulsifying agents, in particular polyethoxylierte and polypropoxylierte emulsifying agents, at rising temperature their solubility behavior of water-solubly too fat-soluble change. Characteristic for the Hydrophilie of a given emulsifying agent is its HLB value.

The definition of the HLB value is given for polyole fatty acid esters by those Relationship

"(formula I)" $\text{HLB} = 20 \cdot (1 - S/A)$

For a group of emulsifying agents, their hydrophilic portion only out The relationship exists, applies ethyl oxide units

"(formula II)" $HLB = E/5$
how

S = saponification number of the ester,
A = acid number recovered of the acid
E = proportion ethylenoxid (in %) at the total molecule mean.

Emulsifying agents with HLB values of 6-8 are generally W/O emulsifying agents, such with HLB values of 8-18 are generally O/W emulsifying agents.

Literature: "Kosmetik - development, production and application cosmetically Means "; W.Umbach (Hrsg.), George Thieme publishing house 1988.

The temperature range, in which the emulsifying agents their solubility aenderen, becomes Phase inversion temperature range mentioned. For that Phase inversion temperature range is within this step also those Abbreviation
EMR3.2 PIT
EMR3.1 to be used.

The change of this solubility behavior expresses itself well-known-measured therein, that a mixture from water, oil and O/W emulsifying agents, which below PIT after agitating an O/W emulsion results in, on a temperature above PIT one brings, typically about 70-90 DEG C, as intermediate stage the condition a micro emulsion continuously, around finally above PIT can one To result in W/O emulsion. If this emulsion is cooled down, again one becomes O/W emulsion receive, which however a droplet size of up to 200 Nm possesses.

Have manufactured micro emulsions of the state of the art in such way however the disadvantage that the droplet size is still quite high, that the emulsion is to bluish at ambient temperature opak white.

Further it is unfavorable that in such way manufactured micro emulsions at high temperature, thus for example in the PIT, practically transparency to be can, but when dropping to ambient temperature again obscurely become.

Also it applied for these grievances thus to remedy.

Surprisingly all these tasks solved through Hair care preparing in form of a transparent or transluzenten Micro emulsion of the type oil in water,

comprehensively an oil phase, and a water phase containing:

one or more polyethoxylierte O/W emulsifying agents and/or
one or more polypropoxylierte O/W emulsifying agents and/or
one or more polyethoxylierte and polypropoxylierte O/W emulsifying agents,

gewuenschtenfalls furthermore containing one or more W/O emulsifying agents
furthermore containing at least a kationisches Tensid, selected from the group the Tenside, which does not possess film-forming characteristics
an emulsifying agent content smaller than 2.0 Gew.- %, related to the total weight that Emulsion, exhibiting

Preferentially the preparing according to invention are available by the fact that a mixture from the basic components, comprehensively water phase, oil phase, one or several of the O/W emulsifying agents according to invention, gewuenschtenfalls one or several W/O emulsifying agents, as well as gewuenschtenfalls further auxiliary -, auxiliary and/or active substances on a temperature within or above of the Phase inversion temperature range brings, and after on ambient temperature cools down.

Preparing according to invention have a low viscosity, are sprayable, are suitable excellently as vehicles for most diverse active substances, in particular lipidloesliche active substances and draw in addition through excellent skin -, Haar-und mucous membrane compatibility out.

Becomes in the JP-A-Hei-06/262060 (in accordance with Patent Abstracts OF Japan) one described solubilisierete preparation, which for example Polyethylenglycolalkylether to cover can. The oil phase of the revealed However the volatile heptane, which landlaeufig, concerns examples hardly as oil component, already no cosmetic or pharmaceutical Oil component to be regarded

can. In accordance with this teachings the manufactured Micro emulsions cannot despite the spoken requirement as Kosmetika or medicines to be regarded.

Furthermore in the US-A-4,146,499 micro emulsions are described, which ethoxylierte raw materials contain, with which however the oil phase typically of such unphysiologischen components such as benzene, Tetrachloromethane, Dichlormethan and fluorine chlorinated hydrocarbons represented becomes. Also this document of the state of the art did not know therefore the way for available invention point.

In the EP-B-490 053 hair cure means in form of a micro emulsion become described, which are characterized by the fact that them between 5,5 and 30 Gew.-% at Tensiden contain. Also this document of the state of the art could not the way to the available invention point

Favourably or the polyethoxylierte will become and/or. polypropoxylierte and/or. polyethoxylierte and polypropoxylierte O/W emulsifying agent or the polyethoxylierten and/or. polypropoxylierten and/or. polyethoxylierten and polypropoxylierten O/W emulsifying agents selected from the group

the Fettalkoholethoxylate of the general formula $R-O-(CH_2-CH_2-O)_n-H$, whereby R branched or normal alkyl -, aryl or alkenyl residue and n one Number from 10 to 50 represent
 the ethoxylierten Wollwachsalkohole,
 the Polyethylenglycolether of the general formula $R-O-(CH_2-CH_2-O)_n-R'$, how R and R' independently branched out or normal alkyl or alkenyl residues and n a number from 10 to 80 represent
 the Fettsaeureethoxylate of the general formula $R-COO-(CH_2-CH_2-O)_n-H$, whereby R a branched or normal alkyl or alkenyl residue and a n a number from 10 to 40 represent,
 the etherified Fettsaeureethoxylate of the general formula $R-COO-(CH_2-CH_2-O)_n-R'$, whereby R and R' branched out independently or normal alkyl or alkenyl residues and n a number from 10 to 80 represent,
 the veresterten Fettsaeureethoxylate of the general formula $R-COO-(CH_2-CH_2-O)_n-C(O)-R'$, whereby R and R' branched out independently or normal alkyl or alkenyl residues and n a number from 10 to 80 represent,
 the Polyethylenglycolglycerinfettsaeureester satisfy and/or insatiated, branched and/or unverzweiger fatty acids and a Ethoxylierungsgrad between 3 and 50,
 the ethoxylierten Sorbitanester with a Ethoxylierungsgrad from 3 to 100
 the Cholesterinethoxylate with a Ethoxylierungsgrad between 3 and 50,
 the ethoxylierten Triglyceride with a Ethoxylierungsgrad between 3 and 150,
 the Alkylethercarbonsaeuren of the general formula $R-O-(CH_2-CH_2-O)_n-CH_2-COOH$ and/or. of them cosmetically or pharmaceutical acceptable salts, whereby R one branched out or normal alkyl or alkenyl residue with 5 - 30 C-atoms and n a number from 5 to 30 represent,
 the Polyoxyethylensorbitolfettsaeureester, based on branched or normal alkane or alkene acids and a Ethoxylierungsgrad from 5 to 100 exhibiting, for example of the Sorbeth type,
 the Alkylethersulfate and/or. these sulfates the underlying acids that general formula $R-O-(CH_2-CH_2-O)_n-SO_3-H$ with cosmetic or pharmaceutical acceptable cations, whereby R a branched or normal alkyl or Alkenyl residue with 5 - a number from 1 to 50 to 30 C-atoms and n represent.
 the Fettalkoholpropoxylate of the general formula $R-O-(CH_2-CH(CH_3)-O)_n-H$, whereby R a branched or normal alkyl or alkenyl residue and a n one Number from 10 to 80 represent,
 the Polypropylenglycolether of the general formula $R-O-(CH_2-CH(CH_3)-O)_n-R'$, whereby R and R' independently branched out or normal alkyl or Alkenyl residues and n a number from 10 to 80 represent
 the propoxylierten Wollwachsalkohole,
 the etherified Fettsaeurepropoxylate of the general formula $R-COO-(CH_2-CH(CH_3)-O)_n-R'$, whereby R and R' branched out independently or normal alkyl or alkenyl residues and n a number from 10 to 80 represent,
 the veresterten Fettsaeurepropoxylate of the general formula $R-COO-(CH_2-CH(CH_3)-O)_n-C(O)-R'$, whereby R and R' independently branched out or normal alkyl or alkenyl residues and n a number of 10 until 80 represents,
 the Fettsaeurepropoxylate of the general formula $R-COO-(CH_2-CH(CH_3)-O)_n-H$, whereby R a branched or normal alkyl or alkenyl residue and a n one Number from 10 to 80 represent,
 the Polypropylenglycolglycerinfettsaeureester more satisfied and/or insatiated, branched and/or unverzweiger fatty acids and one Propoxylierungsgrad between 3 and 80
 the propoxylierten Sorbitanester with a Propoxylierungsgrad from 3 to 100
 the Cholesterinpropoxylate with a Propoxylierungsgrad from 3 to 100
 the propoxylierten Triglyceride with a Propoxylierungsgrad from 3 to 100
 the Alkylethercarbonsaeuren of the general formula $R-O-(CH_2-CH(CH_3)-O)_n-CH_2-COOH$ and/or. of them cosmetically or pharmaceutical acceptable salts, whereby R a branched or normal alkyl or Alkenyl residue and n a number from 3 to 50 explain,
 the Alkylethersulfate and/or. these sulfates the underlying acids that general formula $R-O-(CH_2-CH(CH_3)-O)_n-SO_3-H$ with cosmetic or pharmaceutical acceptable cations, whereby R a branched or normal alkyl or alkenyl residue with 5 - 30 C-atoms and n a number of 1 until 50 represents,

the Fettalkoholethoxylate/propoxylate of the general formula $R-O-X_n-Y_m-H$, where R a branched or normal alkyl or alkenyl residue represent, whereby X and Y not identically are and either a Oxyethylengruppe in each case or a Oxypropylengruppe and a n and an m independently numbers from 5 to 50 represents,
 the Polypropylenglycolether of the general formula $R-O-X_n-Y_m-R'$, whereby R and R' independently branched out or normal alkyl or alkenyl residues represent, whereby X and Y are not identical and in each case either one Oxyethylengruppe or a Oxypropylengruppe and a n and an m independently Numbers from 5 to 100 represent,
 the etherified Fettsaeurepropoxylate of the general formula $R-COO-X_n-Y_m-R'$, whereby R and R' independently branched out or normal alkyl or Alkenyl residues represent, whereby X and Y are not identical and in each case either a Oxyethylengruppe or a Oxypropylengruppe and a n and an m independently numbers from 5 to 100 represent,
 the Fettsaeureethoxylate/propoxylate of the general formula $R-COO-X_n-Y_m-H$, where R a branched or normal alkyl or alkenyl residue, whereby X and Y not identically is and in each case either a Oxyethylengruppe or a one Oxypropylengruppe and n and m independently numbers from 5 to 50 represent.

In particular is favourable, if the polyethoxylierte and/or. polypropoxylierte and/or. polyethoxylierte and polypropoxylierte O/W emulsifying agent or those polyethoxylierten and/or. polypropoxylierten and/or. polyethoxylierten and polypropoxylierten O/W emulsifying agents one selects or become from the group

the Fettalkoholethoxylate of the general formula $R-O-(CH_2-CH_2-O)_n-H$, whereby R a branched or normal alkyl or alkenyl residue with 5 - 30 A number from 10 to 25 to C-atoms and n represent,
 the ethoxylierten Wollwachsalkohole with HLB values of 11 - 16, completely particularly favourably also with HLB values of 14 - 16,
 the Polyethylenglycolether of the general formula $R-O-(CH_2-CH_2-O)_n-R'$, where R and R' independently branched out or normal alkyl or Alkenyl residues with 5 - a number from 10 to 40 to 30 C-atoms and n represent,
 the Fettsaeureethoxylate of the general formula $R-COO-(CH_2-CH_2-O)_n-H$, whereby R a branched or normal alkyl or alkenyl residue with 5 - 30 A number from 10 to 30 to C-atoms and n represent,
 the etherified Fettsaeureethoxylate of the general formula $R-COO-(CH_2-CH_2-O)_n-R'$, whereby R and R' branched out independently or normal alkyl or alkenyl residues with 5 - 30 C-atoms and n a number of 10 to 50 represents,
 the veresterten Fettsaeureethoxylate of the general formula $R-COO-(CH_2-CH_2-O)_n-C(O)-R'$, whereby R and R' branched out independently or normal alkyl or alkenyl residues with 5 - 30 C-atoms and n a number from 10 to 50 represent,
 the Polyethylenglycolglycerinfettsaeureester satisfy and/or insatiated, branched and/or unverzweiger fatty acids with 6 to 26 C-atoms and one Ethoxylierungsgrad between 3 and 40
 the ethoxylierten Sorbitanester with a Ethoxylierungsgrad from 3 to 30
 the Cholesterinethoxylate with HLB values of 11 - 16, completely particularly favourably with HLB values of 14 - 16
 the ethorylierten Triglyceride with HLB values of 11 - 16, completely particularly favourably also with HLB values of 14 - 16
 the Alkylethercarbonsaeuren of the general formula $R-O-(CH_2-CH_2-O)_n-CH_2-COOH$ and/or. of them cosmetically or pharmaceutical acceptable salts, whereby R one branched out or normal alkyl or alkenyl residue with 5 - 30 C-atoms and n a number from 10 to 20 represent,
 the Polyoxyethylensorbitolfettsaeureester, based on branched or normal alkane or alkene acids and a Ethoxylierungsgrad from 10 to 80 exhibiting, for example of the Sorbeth type,
 the Alkylethersulfate and/or. these sulfates the underlying acids that general formula $R-O-(CH_2-CH_2-O)_n-SO_3-H$ with cosmetic or pharmaceutical acceptable cations, whereby R a branched or normal alkyl or Alkenyl residue with 5 - a number from 3 to 30 to 30 C-atoms and n represent,
 the Fettalkoholpropoxylate of the general formula $R-O-(CH_2-CH(CH_3)-O)_n-H$, whereby R a branched or normal alkyl or alkenyl residue with 5 - 30 A number from 10 to 30 to C-atoms and n represent,
 the Polypropylenglycolether of the general formula $R-O-(CH_2-CH(CH_3)-O)_n-R'$, whereby R and R' independently branched out or normal alkyl or Alkenyl residues with 5 - a number from 10 to 40 to 30 C-atoms and n represent,
 the propoxylierten Wollwachsalkohole with HLB values of 11 - 16, completely particularly favourably with HLB values of 14,5 - 15,5,
 the Fettsaeurepropoxylate of the general formula $R-COO-(CH_2-CH(CH_3)-O)_n-H$, whereby R a branched or normal alkyl or alkenyl residue with 5 - 30 A number from 10 to 40 to C-atoms and n represent,
 the etherified Fettsaeurepropoxylate of the general formula $R-COO-(CH_2-CH(CH_3)-O)_n-R'$, whereby R and R' branched out independently or normal alkyl or alkenyl residues with 5 - 30 C-atoms and n a number from 10 to 30 represent,
 the veresterten Fettsaeurepropoxylate of the general formula $R-COO-(CH_2-CH(CH_3)-O)_n-C(O)-R'$, whereby R and R' independently branched out or normal alkyl or alkenyl residues with 5 - 30 C-atoms and n a number from 10 to 50 represent,
 the Polypropylenglycolglycerinfettsaeureester more satisfied and/or insatiated, branched and/or unverzweiger fatty acids with 6 to 26 C-atoms and a Propoxylierungsgrad between 3 and 50
 the propoxylierten Sorbitanester with a Propoxylierungsgrad from 3 to 80
 the Cholesterinpropoxylate with HLB values of 11 - 16, completely particularly favourably also with HLB values of 14,5 - 15,5
 the proporylierten Triglyceride with HLB values of 11 - 16, completely particularly favourably also with HLB values of 14,5 - 15,5
 the Alkylethercarbonsaeuren of the general formula $R-O-(CH_2-CH(CH_3)O)_n-CH_2-COOH$ and/or. of them cosmetically or

pharmaceutical acceptable salts, whereby R a branched or normal alkyl or Alkenyl residue with 5 - a number from 10 to 30 to 30 C-atoms and n represent, the Alkylethersulfate and/or. these sulfates the underlying acids that general formula $R-O-(CH_2-CH(CH_3)-O)_n-SO_3-H$ with cosmetic or pharmaceutical acceptable cations, whereby R a branched or normal alkyl or alkenyl residue with 5 - 30 C-atoms and n a number of 1 until 30 represent.

The assigned become particularly according to invention favourable polyethoxylierten and/or. polypropoxylierten and/or. polyethoxylierten and polypropoxylierten O/W emulsifying agents selected from the group of the substances also HLB values of - 16, completely particularly favourably also with HLB values of 14 - 16, if ' exhibit the O/W emulsifying agents satisfied remainders of R and R. Point those O/W emulsifying agents insatiated remainders of R and/or R ' up, or lie Forwards, then the preferential HLB value of such emulsifying agents knows ISO alkyl derivatives also lower or over it lie.

It is of advantage, which Fettalkoholethoxylate from the group of the ethoxylierten Stearylalkohole, Cetylalkohole, Cetylstearylalkohole (Cetarylalkohole) too select. Are in particular preferential:

Polyethylenglycol(13)stearylether (Steareth-13), Polyethylenglycol(14)stearylether (Steareth-14), Polyethylenglycol(15)stearylether (Steareth-15), Polyethylenglycol(16)stearylether (Steareth-16), Polyethylenglycol(17)stearylether (Steareth-17), Polyethylenglycol(18)stearylether (Steareth-18), Polyethylenglycol(19)stearylether (Steareth-19), Polyethylenglycol(20)stearylether (Steareth-20),

Polyethylenglycol(12)isostearylether (Isosteareth-12), Polyethylenglycol(13)isostearylether (Isosteareth-13), Polyethylenglycol(14)isostearylether (Isosteareth-14), Polyethylenglycol(15)isostearylether (Isosteareth-15), Polyethylenglycol(16)isostearylether (Isosteareth-16), Polyethylenglycol(17)isostearylether (Isosteareth-17), Polyethylenglycol(18)isostearylether (Isosteareth-18), Polyethylenglycol(19)isostearylether (Isosteareth-19), Polyethylenglycol(20)isostearylether (Isosteareth-20),

Polyethylenglycol(13)cetylether (Ceteth-13), Polyethylenglycol(14)cetylether (Ceteth-14), Polyethylenglycol(15)cetylether (Ceteth-15), Polyethylenglycol(16)cetylether (Ceteth-16), Polyethylenglycol(17)cetylether (Ceteth-17), Polyethylenglycol(18)cetylether (Ceteth-18), Polyethylenglycol(19)cetylether (Ceteth-19), Polyethylenglycol(20)cetylether (Ceteth-20),

Polyethylenglycol(13)isocetylether (Isoceteth-13), Polyethylenglycol(14)isocetylether (Isoceteth-14), Polyethylenglycol(15)isocetylether (Isoceteth-15), Polyethylenglycol(16)isocetylether (Isoceteth-16), Polyethylenglycol(17)isocetylether (Isoceteth-17), Polyethylenglycol(18)isocetylether (Isoceteth-18), Polyethylenglycol(19)isocetylether (Isoceteth-19), Polyethylenglycol(20)isocetylether (Isoceteth-20),

Polyethylenglycol(12)oleylether (Oleth-12), Polyethylenglycol(13)oleylether (Oleth-13), Polyethylenglycol(14)oleylether (Oleth-14), Polyethylenglycol(15)oleylether (Oleth-15),

Polyethylenglycol(12)laurylether (Laureth-12), Polyethylenglycol(12)isolaurylether (Isolaureth-12).

Polyethylenglycol(13)cetylstearylether (Cetareth-13), Polyethylenglycol(14)cetylstearylether (Cetareth-14), Polyethylenglycol(15)cetylstearylether (Cetareth-15), Polyethylenglycol(16)cetylstearylether (Cetareth-16), Polyethylenglycol(17)cetylstearylether (Cetareth-17), Polyethylenglycol(18)cetylstearylether (Cetareth-18), Polyethylenglycol(19)cetylstearylether (Cetareth-19), Polyethylenglycol(20)cetylstearylether (Cetareth-20),

Furthermore it is of advantage, the Fettsaeurethoxylate from the following group too select:

Polyethylenglycol(20)stearat, Polyethylenglycol(21)stearat, Polyethylenglycol(22)stearat, Polyethylenglycol(23)stearat, Polyethylenglycol(24)stearat, Polyethylenglycol(25)stearat, Polyethylenglycol(12)isostearat, Polyethylenglycol(13)isostearat, Polyethylenglycol(14)isostearat, Polyethylenglycol(15)isostearat, Polyethylenglycol(16)isostearat, Polyethylenglycol(17)isostearat, Polyethylenglycol(18)isostearat, Polyethylenglycol(19)isostearat, Polyethylenglycol(20)isostearat, Polyethylenglycol(21)isostearat, Polyethylenglycol(22)isostearat, Polyethylenglycol(23)isostearat, Polyethylenglycol(24)isostearat, Polyethylenglycol(25)isostearat,

Polyethylenglycol(12)oleat, Polyethylenglycol(13)oleat, Polyethylenglycol(14)oleat, Polyethylenglycol(15)oleat, Polyethylenglycol(16)oleat, Polyethylenglycol(17)oleat, Polyethylenglycol(18)oleat, Polyethylenglycol(19)oleat, Polyethylenglycol(20)oleat

As ethoxylierte Alkylethercarbonsaeure and/or. their salt knows favourably the Natriumlaureth-11-carboxylat are used.

As Alkylethersulfat sodium Laureth 1-4 sulfate can favourably used become.

As ethoxyliertes Cholesterinderivat can favourably Polyethylenglycol(30)Cholesterylether to be used. Also Polyethylenglycol(25)

Sojasterol worked satisfactorily.

As ethoxylierte Triglyceride can do favourably the Polyethylenglycol(60) Evening prime rose Glycerides to be used (Evening prime rose = night candle)

Further the Polyethylenglycolglycerinfettsaeureester from that is of advantage, Group of Polyethylenglycol(20)glyceryllaurat, Polyethylenglycol(21)glyceryllaurat, Polyethylenglycol(22)glyceryllaurat, Polyethylenglycol(23)glyceryllaurat, Polyethylenglycol(6)glycerylcaprat/caprinat, Polyethylenglycol(20)glyceryloleat, Polyethylenglycol(20)glycerylisostearat, To select Polyethylenglycol(18)glyceryloleat/cocoat.

It is likewise favorable, the Sorbitanester from the group Polyethylenglycol(20)sorbitanmonolaurat, Polyethylenglycol(20)sorbitanmonostearat, Polyethylenglycol(20)sorbitanmonoisostearat, Polyethylenglycol(20)sorbitanmonopalmitat, To select Polyethylenglycol(20)sorbitanmonooleat.

When fakultative, favourable nevertheless according to invention W/O emulsifying agents can are used: Fettalkohole with 8 to 30 carbon atoms, Monoglycerinester satisfy and/or insatiated, more branched and/or normal alkane carbonic acids of a chain length from 8 to 24, in particular 12 - 18 C-atoms, Diglycerinester satisfy and/or insatiated, more branched and/or normal alkane carbonic acids of a chain length from 8 to 24, in particular 12 - 18 C-atoms, Monoglycerinether more satisfied and/or insatiated, branched and/or normal alcohols of a chain length more satisfied by 8 to 24, in particular 12 - 18 C-atoms, Diglycerinether and/or insatiated, branched and/or normal alcohols of one Chain length of 8 to 24, in particular 12 - 18 C-atoms, Propylenglycolester satisfy and/or insatiated, more branched and/or normally Alkane carbonic acids of a chain length of 8 to 24, in particular 12 - 18 C-atoms as well as Sorbitanester satisfy and/or insatiated, more branched and/or normal alkane carbonic acids of a chain length from 8 to 24, in particular 12 - 18 C-atoms.

In particular favourable W/O emulsifying agents are Glycerylmonostearat, Glycerylmonoisostearat, Glycerylmonomyristat, Glycerylmonooleat, Diglycerylmonostearat, Diglycerylmonoisostearat, Propylenglycolmonostearat, Propylenglycolmonoisostearat, Propylenglycolmonocaprylat, Propylenglycolmonolaurat, Sorbitanmonoisostearat, Sorbitanmonolaurat, Sorbitanmonocaprylat, Sorbitanmonooleat, Saccharosedistearat, Cetylalkohol, Stearylalkohol, Arachidylalkohol, Behenylalkohol, Isobehenylalkohol, Selachylalkohol, Chimylalkohol, Polyethylenglycol(2)stearylether (Steareth-2), Glycerylmonolaurat, Glycerylmonocaprinat, Glycerylmonocaprylat.

The oil phase of the micro emulsions according to invention favourably selected out the group of the esters from satisfied and/or insatiated, branched and/or normal alkane carbonic acids of a chain length from 3 to 30 C-atoms and satisfied and/or insatiated, branched and/or normal alcohols of a chain length of 3 to 30 C-atoms, from the group the ester from aromatic carbonic acids and satisfied and/or insatiated, branched out and/or normal alcohols of a chain length from 3 to 30 C-atoms. Such ester oils can be selected then favourably from the group Isopropylmyristat, Isopropylpalmitat, Isopropylstearat, Isopropyloleat, N-Butylstearat, n-Hexyllaurat, n-Decyloleat, Isooctylstearat, Isononylstearat, Isononylisononanoat, 2-Ethylhexylpalmitat, 2-Ethylhexyllaurat, 2-Hexyldecylstearat, 2-Octyldodecylpalmitat, Oleyloleat, Oleylerucat, Erucyloleat, Erucylrucat as well as synthetic, halfsynthetic and natural Mixtures of such esters, z.B. Jojobael.

Furthermore the oil phase can be selected favourably from the group that branched out and normal hydrocarbons and grow, the Silikonoele, the Dialkylether, which group of the satisfied or insatiated, branched or normal alcohols, as well as the Fettsaeuretriglyceride, in particular that Triglycerinester satisfy and/or insatiated, more branched and/or normal alkane carbonic acids of a chain length from 8 to 24, in particular 12 - 18 C-atoms. The Fettsaeuretriglyceride can for example favourably from the group of the synthetic, halfsynthetic are selected and natural oils, z.B. Olive oil, sonnenblumenoel, Sojaoel, peanut oil, rapeseel oil, Almond oil, palmoel, Kokosoel, palmkernoel and so on.

Also arbitrary merging of such oil and wax components are favourable to begin in the sense of the available invention.

It can be also if necessary favourably, waxes, for example Cetylpalmitat to begin as exclusive Lipidkomponente of the oil phase. In such cases can the O/W Mikroemulsionen according to invention also if necessary as microdisperse ions of firm wax particles result.

Favourably the oil phase selected from the group of 2-Ethylhexylisostearat, Octyldodecanol, Isotridecylisononanoat, Isoleicosan, Ethylhexylcocoat, C12-15-Alkylbenzoat, Capryl Caprinsaeure triglycerid, Dicaprylylether.

Mixtures from C12-15-Alkybenzoat are particularly favourable and 2-Ethylhexylisostearat, mixtures from C12-15-Alkybenzoat and Isotridecylisononanoat as well as mixtures from C12-15-Alkybenzoat, 2-Ethylhexylisostearat and Isotridecylisononanoat.

From the hydrocarbons are favourable paraffin oil, Squalan and Squalen in To use senses of the available invention.

, the oil phase of the preparing according to invention is however preferred to select from the group of the cyclischen and/or linear Silikone. This can be present as monomers, which usually by structural components characterized are as follows:
EMI17.1

As favourably according to invention linear silicones with several, which can be used Siloxyleinheiten are characterized generally by structural components as follows:

EMI17.2

whereby the siliciumatome with same or different alkyl residues and/or aryl residues to be substituted can, who here generalizing by the remainders of $g_1 - R_4$ are represented (it wants to say that the amount of that different remainder is not necessarily limited on up to 4). m can values of 2 - 200.000 accept.

Such favourably according to invention cyclischen silicones which can be used become generally by structural components characterizes as follows

EMI17.3

whereby the siliciumatome with same or different alkyl residues and/or aryl residues to be substituted can, who here generalizing by the remainders of $g_1 - R_4$ are represented (it wants to say that the amount of that different remainder is not necessarily limited on up to 4). n can take values from 3/2 to 20. Broken values for n consider, that odd-number number of Siloxylgruppen in the Cyclus available its can.

Phenyltrimethicon is selected favourably as silicone oil. Also different Silicone oils, for example Dimethicon, Phenylmethicon, Cyclomethicon (Octamethylcyclotetrasiloxan) for example Hexamethylcyclotrisiloxan, Polydimethylsiloxan, Poly(methylphenylsiloxan), Cetyltrimethicon, Behenoxydimethicon are favourably in the sense of the available invention too use.

Mixtures from Cyclomethicon are furthermore favourable and Isotridecylisononanoat, from Cyclomethicon and 2-Ethylhexylisostearat.

In addition, it is favourable, silicone oils of similar constitution as that to select managing designated connections, their organic seitenketten derivatisiert, for example polyethoxiliert and/or polypropoxiliert are.

In addition for example Polysiloxan polyalkyl polyether copolymers count like that Cetyl Dimethicon Copolyol, (Cetyl Dimethicon Copolyol (and) Polyglyceryl-4-Isostearat (and) Hexyllaurat)

According to invention used the kationischen Tenside can preferentially selected become from the group of the quaternären ammonium compounds, if this none film-forming characteristics possess, in particular Benzyle tri alkyl ammonium chloride or -bromide, as for example Benzyltrimethylstearylammmoniumchlorid, furthermore alkyl tri alkyl ammonium salts, for example for example Cetyltrimethylammmoniumchlorid or bromide, Alkyldimethylhydroxyethylammmoniumchloride or bromide, Dialkyldimethylammmoniumchloride or bromide, Alkylamidethyltrimethylammmoniumethersulfate, Alkylpyridiniumsalze, for example Lauryl or Cetylpyrimidiniumchlorid, Imidazolinderivate and Connections with a kationischem character such as amine oxides, for example Alkyldimethylaminoxide or Alkylaminoethyltrimethylaminoxide. Are favourable to use in particular Cetyltrimethylammmoniumsalze.

It can prove according to invention as particularly favourable, if those Silicone oils in the form are derivatisiert that them or several quaternäre groups of ammonium in one or more organic remainders exhibit, for example diquaternäre Polydimethyldioxane such as Quaternium-80 or Dimethicon propylbetaine and so on.

Preparing according to invention can beside that according to invention mandatory kationischen Tensiden also anionische, nichtionische and/or amphotere Tenside contains, for example conventional soaps, z.B. Fatty acid salts of the sodium, alkyl sulfates, Alkylethersulfate, alkane and Alkylbenzenesulfonates, Sulfoacetate, Sulfobetaine, Sarcosinate, Amidosulfobetaine, Sulfosuccinate, Sulfobernsteinsaeurehalbester, Alkylethercarboxylate, protein fatty acid condensates, Alkylbetaine and Amidobetaine, Fettsaeurealkanolamide, Polyglycoether derivatives.

Preparing according to invention to the hair care can also if necessary favourably for the cleaning that hair and the scalp to be used.

Cosmetic preparing, the cosmetic cleaning preparing for those Hair and/or. the scalp represent, can in liquid or semisolid form are present, for example as gels. The preparing contain at least one kationische surface-active substance or mixtures from it. Furthermore they can gewuenschtenfalls anionisch, not ionische and/or amphotere surface-active Substances or mixtures from it, if necessary electrolytes and aids, as it for it to be usually used. The surface-active substance can preferentially in a concentration between 1 and 30 Gew.-% into that Cleaning preparing are present, related to the total weight that Preparing. contained

Cosmetic preparing, which a Shampooierungsmittel represents, contain preferably additionally at least a anionische, not ionische or amphotere surface-active substance or mixtures from it, if necessary Electrolytes and aids, as they are usually used for it. Those surface-active substance can preferentially in a concentration between 0,1 and 5 Gew.-% in the cleaning preparing are present, related to that Total weight of the preparing.

The according to invention for the cleaning of the hair and/or. the scalp intended preparing contain water except the aforementioned Tensiden and if necessary into the Kosmetik usual additives, for example Perfume, thick, coloring materials, Desodorantien, antimicrobial materials, wax protective Agentien, integrations and Sequestrierungsagentien, Perlglanzagentien, plant extracts, vitamine, active substances and such a thing.

The preparing according to invention have, despite their oil rate, in amazing way very good foam development, high cleaning strength and work to a considerable degree regenerating regarding the general skin condition. In particular if the preparing according to invention work strike-smoothing, decrease that Dryness feeling of the skin and make supple the skin.

Such execution forms of the preparing according to invention maintain through Environmental influences damaged or strained hair and/or. bend such Environmental influences forwards. Furthermore the preparing according to invention lend to that Haartracht loose abundance and firmness, without working sticky. They serve that Increase of the hair abundance, for the improvement of the Haarbody and the hair volume as well as the stop of the haartracht.

The production of the micro emulsions according to invention takes place favourably such that a mixture from the basic components, comprehensively water phase, Oil phase, or several of the O/W emulsifying agents according to invention, gewuenschtenfalls one or more W/O emulsifying agents, as well as gewuenschtenfalls further auxiliary -, auxiliary and/or active substances, which underneath of the Phase inversion temperature range form an O/W emulsion, on a temperature above or within the phase inversion temperature range, and those brings formed micro emulsion after on ambient temperature cools down. This happens preferred under agitating.

It is possible in each case to do without a homogenizing step.

As favourable embodiment of the available invention becomes likewise regarded a procedure for the production of O/W Mikroemulsionen, which cover:

- (1) a water phase, gewuenschtenfalls comprehensively usual, in water soluble or dispersable substances,
 - (2) an oil phase, which gewuenschtenfalls usual, in this oil phase soluble or dispersable substances covers,
 - (3) one or more polyethoxylierte O/W emulsifying agents and/or one or several polypropoxylierte O/W emulsifying agents and/or or several polyethoxylierte and polypropoxylierte O/W emulsifying agents,
 - (4) gewuenschtenfalls one or more W/O emulsifying agents
 - (5) at least a kationisches Tensid, which no film-forming Characteristics possesses,
- by the fact characterized that

- (A) the initial concentrations of the oil phase, the water phase and gewuenschtenfalls one or several W/O emulsifying agents to be selected and these Components to be given to each other,
- (B) the initial concentration or the O/W emulsifying agents, whatever zero to be if necessary alike can, are selected and these or these O/W emulsifying agents to the mixture receiving in (A) to be given
- (C) whereby the mixture received in (B) possesses an output temperature
- (D) the mixture by suitable variation, receiving in (B), at least one Parameter, selected from the group of temperature and the concentration and/or. Concentrations at least one of the selected emulsifying agents and/or the oil phase and/or the water phase, the in such a way formed mixture the phase inversion range between W/O emulsions and O/W emulsions goes through and into the range is brought, where the mixture as O/W emulsion and/or O/W Mikroemulsion is present,
- (E) the mixture received in (D) then if necessary further One subjects to preparation steps.

Procedures are equally according to invention favourable, with which those Variation of the parameter or the parameter therein exists that

- (d1) with given concentration of the O/W emulsifying agent and/or. the multiplicity on O/W emulsifying agents as well as the water phase and the oil phase the temperature of the Mixture one varies, and/or. that
- (d2) at given temperature the concentration at least one O/W emulsifying agent, and/or. that
- (d3) at given temperature and given concentration at least an O/W emulsifying agent, the concentration of the oil phase and or the concentration the water phase one varies.

It can be if necessary according to invention preferential, several parameters at the same time or successively to vary.

According to invention favourable hair-maintaining preparing can receive become, if the portion of the polyethoxylierten and/or. polypropoxylierten and/or. the polyethoxylierten and polypropoxylierten emulsifying agents under 1,5 Gew.-%, in particular under 1,0 Gew.-%, related to the total weight of the preparation is appropriate, and for less than 0.5 Gew.-% to one or more kationischen Tensiden are present.

In Fig. 1 becomes a highly simplified representation of a phase diagram shown. The variable parameter P becomes against the temperature θ ; as the second variable laid on. P places thereby a concentration parameter, either the portion of the oil phase, the portion of the water phase or those Concentration of an emulsifying agent or an emulsifying agent mixture. For systems according to invention it applies with the fact that at lower temperatures one O/W emulsion is present and with increase of the temperature that Phase inversion range to be gone through can. With further increase that Temperature W/O emulsions are observed. The structure of the system in Phase inversion range is not critical after the appearance for those available invention. Conceivable it is for example that in Phase inversion range laminated phases, bikontinuierliche phases, cubic, hexagonal and/or. inversely hexagonal phases are present, also that that Phase inversion range from several homogeneous or more or less different phases is compound.

The phase inversion range can be represented mathematically as point set within the straight-line coordinate system SIGMA, which by the sizes Temperature, the concentration of a suitable emulsifying agent and/or. one Emulsifying agent mixture in the preparation as well as the respective concentrations one forms for the oil phase and the water phase, in accordance with:

$$\text{SIGMA} = \{O, \theta, m, H, W\},$$
with

O - Origin
 θ - temperature
m - Concentration of the emulsifying agent/emulsifying agent mixture
H - Concentration of the oil phase
W - Concentration of the water phase

Must strictly speaking naturally in a mehrkomponentigen emulsifying agent system the contribution m_i of each individual emulsifying agent for overall function considers become, which with a i-komponentigen emulsifying agent system for relationship $\text{SIGMA} = \{O, \theta, m_1, m_2, \dots, m_i, H, W\}$ leads.

The phase inversion range PHI adjusts thereby in the mathematical sense coherent area or a multiplicity of coherent areas within the coordinate system SIGMA. PHI represents the total quantity that Points of coordinate $K(\theta, A, m_1, m_2, \dots, m_i, H, W)$, which mixtures according to invention from water phase of the concentration W, oil phase that Concentration H, i emulsifying agents according to invention of the concentration m_i with that Temperature θ ; it determines and to which it applies that during the transition of a coordinate K1 EMERGENCY ELEMENT PHI to a coordinate K2 epsilon PHI Phase inversion occurs, as Fig. 2 described.

It participates insignificant whether the phase inversion range of a given system only one coherent (i + represents 3)-dimensional area or out several coherent, but from each other separated such areas exists, thus several phase inversion ranges of a given system accordingly. In the context of revealing hereby submitted always becomes therefore generalizing of
EMR3.2 that
EMR3.1 or
EMR3.2 one
EMR3.1 phase inversion range spoken, also when being present two or several from each other separated such ranges.

As variable coordinates in Fig.2 becomes temperature θ ; and those that before-described concentration parameters P indicated, whereby left open to remain can, which it concerns special concentration parameter. With Transition from K1 to K2 is only increased the temperature, the others Variable ones are kept constant.

Under the conditions according to invention this process is not reversible, D.h., the system of the coordinate K2 turns epsilon PHI again to the coordinate K1 EMERGENCY ELEMENT PHI back, can do transparent according to invention O/W Mikroemulsionen to be received.

The practice of the production of a micro emulsion according to invention exists accordingly favourably in it, after selection of suitable raw materials, D.h., water and oil phase, one or more according to invention used O/W emulsifying agents, the latter or

the latter available in concentrations, with which Phase inversion for the given mixture possible is, and if necessary further substances to together-admit the individual components under agitating through To cause increase of the temperature of the mixture phase inversion, after to leave under continual agitating the mixture on ambient temperature cooling.

It is possible in addition, to vary several parameters at the same time as in Fig.3 indicated. In Fig. 3 the concentration of the water phase becomes against those Temperature laid on. Know EMERGENCY ELEMENT PHI on the basis of the coordinate K1 by increase of the temperature, while maintaining all other parameters, those Coordinates K2 EMERGENCY ELEMENT PHI and K4 EMERGENCY ELEMENT PHI to be reached and/or. K3 EMERGENCY ELEMENT PHI. On the basis of the coordinates K3 and K4 can by lowering the temperature, while maintaining all other parameters, back to Coordinate K1 O/W Mikroemulsionen according to invention to be received.

On the basis of the coordinates K3 and K4 can by lowering the temperature, and by additional variation of the concentration of the oil phase, in Fig.3 through Reached by water, the coordinate K5 and according to invention know addition O/W Mikroemulsionen to be received.

It is in view of the Fig. 3 consistently that, on the basis of the coordinate K4, although this is present outside of the phase inversion range, systems to be received can, similarly those, which proceed from K3, there also on the basis of K4 with lowering of the temperature the phase inversion range inevitably to be crossed must.

Also on the basis of the coordinate K1 that can by variation of the concentration Water phase, thus for example by addition of water, like in Fig. 3 specified, reached and according to invention know the coordinate K5 O/W Mikroemulsionen to be received. In addition must however ahead-skillfully it becomes that in this case already a O/W Mikroemulsion according to invention, to a certain extent as concentrate, to be present must, which then by diluting too a O/W Mikroemulsion according to invention of changed composition one converts.

It was however after everything amazing and had therefore independent inventive activity that also on the basis of the coordinate K2, which outside of the Phaseninversonsbereiches, is it lies with simple variation the temperature back to the coordinate K1 or additional variation that Concentration of the oil phase, thus for example by additional diluting also a water phase to the coordinate K5, O/W Mikroemulsionen according to invention are available, without phase inversion will go through. This happens favourably in the way that a mixture from the basic components, comprehensively Water phase, oil phase, or several according to invention the used O/W emulsifying agents, gewünschtenfalls one or more W/O emulsifying agents, as well as gewünschtenfalls further auxiliary -, auxiliary and/or active substances, which below the phase inversion temperature range form an O/W emulsion, on one Temperature brings,

with which the components soluble in the oil phase either solved or at least in melted are present and which at least the fusing temperature of the maximummelting, not in available oil component corresponds to solved, which lies below the phase inversion temperature range of the system, and the developed O/W emulsion under formation of a O/W Mikroemulsion after on ambient temperature cools down. This happens preferentially under agitating.

This procedure according to invention is particularly well suitable, if that O/W Mikroemulsionen according to invention heat sensitive or volatile Substances to be incorporated are. In addition this is with relative low temperatures procedures in relation to usual procedures, which can be accomplished energy-saving.

In Fig. 4 the case is described, in which in the coordinate L1 first no O/W emulsifying agent according to invention is present, and in which the system through Increase the temperature to coordinates a L3 EMERGENCY ELEMENT PHI or to one Coordinate L2 EMERGENCY ELEMENT PHI is brought. Of course those can Coordinate L2 also by cooling in the coordinate of a L3 available System to be reached. The coordinates L2 and L3, in those for example W/O emulsions to be present can, differ only in principle because the L3 is higher assigned temperature than each temperature, those that phase inversion temperature ranges to be assigned knows.

The presence of an additional W/O emulsifying agent for systems, those in Fig. 4 are symbolized, is not necessarily, however favourable necessarily. Addition an O/W emulsifying agent or several according to invention of such emulsifying agents in the coordinates, the system carries L2 or L3, with lowering of the temperature to the coordinate L4, with which then a O/W Mikroemulsion according to invention is present.

A further favourable execution form of the procedure according to invention accordingly of it, after the selection of suitable raw materials, D consists.h., water and oil phase and if necessary further substances, the individual components under Agitate on a temperature to bring, with which phase inversion for that given mixture is possible, and by addition according to invention of the used O/W emulsifying agent or according to invention used the O/W emulsifying agents to the mixture To cause phase inversion, after under continual agitating the mixture to leave on ambient temperature cooling.

It does not exceed a being able of the specialist, by simple attempts that to determine suitable temperature range, within its a given Mixture phase inversion continuously can. Ueberlicherweise is this Temperature range between 70 and 95 DEG C to select, can in the single case also over it or under it settled its.

In practice is possible and if necessary even favourable, with that Production of a micro emulsion according to invention the temperature range, that the phase inversion range to be assigned can to exceed also there go through with the cooling on ambient temperature this range then inevitably becomes.

The additive of electrolytes causes a change of the solubility behavior a hydrophilic emulsifying agent. The micro emulsions according to invention contain therefore vorteilhaft electrolytes, in particular one or more salts also the following anions: Chloride, furthermore inorganic Oxo element anions, of this in particular sulfates, carbonates, phosphates, borate and aluminates. Also on organic anions which are based electrolytes can favourably used become, for example lactate, acetates, Benzoate, Propionate, tartrate, CIT rate and other more. Comparable effects are also through To obtain Ethylendiamintetraeessigsaeure and their salts.

As cations of the salts prefers ammonium, - alkyl ammonium, - Alkali metal -, alkaline earth metal, - magnesium -, iron and/or. Zinc ions uses. It actually it requires no mention that in Kosmetika only physiologically harmless electrolytes to be used should. Special medical Applications of the micro emulsions according to invention can on the other hand, at least in principle, cause the use of electrolytes, which without medical supervision to be used should not.

Kaliumchlorid, common salt, magnesium sulfate, zinc sulfate is particularly preferential and mixtures from it. Salt mixtures are likewise favourable like it in arise to natural salt of the dead sea.

The concentration of the electrolytes should about 0.1 - 10.0 Gew.-%, particularly favourably about 0.3 - 8.0 Gew.% amount to, related to that Total weight of the preparation.

The preparing according to invention can in the form of Aerosolen, thus out Aerosolbehaeltern, squeezing bottles or by a pumping device sprayable Preparations are present or in the form of by means of roll on devices orderable liquid compositions, however also in the form of from normal Bottles and containers orderable micro emulsions.

As propellants for, from Aerosolbehaeltern sprayable according to invention cosmetic Desodorantien is the usual well-known volatile, liquefied propellants, for example hydrocarbons (propane, butane, ISO butane) suitably, which are used with one another alone or in mixture can. Also compressed air is to be used favourably.

Naturally the specialist that there are actually not-toxic propulsion gases, knows those in principle for the available invention suitably would however be, on nevertheless because of precarious effect on the environment or other Attendant circumstances to be done without should, in particular Fluorine chlorinated hydrocarbons (FCKW).

It has itself in addition in surprising way put out that with that Use of propellants soluble in the oil phase, thus for example usual propane butane mixtures, the O/W Mikroemulsionen according to invention not simply as Aerosoltröpfchen to be sprayed, but itself too fine-bubble, rich foams develop, as soon as such with such Propellants experience loaded systems pressure relaxation.

Such after-foaming preparing become therefore likewise as favourable embodiments the available invention with independent inventive activity regarded.

When using propellants insoluble in the oil phase those become O/W Mikroemulsionen according to invention as Aerosoltröpfchen sprays.

The preparing according to invention contain favourably or several Antioxidantien. As favorable, but the one which can be used nevertheless fakultativ Antioxidantien everything for cosmetic and/or dermatologische applications suitable or common Antioxidantien to be used. It participates favourably to use Antioxidantien as only wirkstoffklasse about if a cosmetic or dermatologische application in the front reason stands like the fight of the oxidative demand of the skin. In addition, it is favorably, the micro emulsions according to invention with a content of one or to provide several Antioxidantien, if the preparing another Purposes to serve are, z.B. as Desodorantien or sun protective agents.

Particularly favourably the Antioxidantien selected from the group consisting of

Amino acids (z.B. Histidin, Tyrosin, Tryptophan) and their derivatives, Imidazole (z.B. Urocaninsaeure) and their derivatives, peptide such as D, L-Carnosin, D-Carnosin, L-Carnosin and their derivatives (z.B. Anserin), Carotinoide, Carotine (z.B. alpha Carotin, beta Carotin, Lycopin) and their derivatives, Liponsaeure and of them Derivatives (z.B. Dihydroliponsaeure), Aurothioglucose, Propylthiouracil and others Thiole (z.B. Thioredoxin, Glutathion, Cystein, Cystin, Cystamin and of them Glycosyl

-, n-acetyl -, methyl -, ethyl -, Propyl -, amyl -, Butyl and Lauryl -, Palmitoyl -, Oleyl -, gamma Linoleyl -, Cholesteryl - and Glycerylester) as well as their salts, Dilaurylthiodipropionat, Distearylthiodipropionat, Thiodipropionsaeure and their derivatives (ester, ether, peptide, lipide, Nucleotides, nucleosides and salts) as well as Sulfoximinverbindungen (z.B. Buthioninsulfoximine, Homocysteinsulfoximin, Buthioninsulfone, Penta -, Hexadecimal -, Heptahioninsulfoximin) in very small compatible dosages (z.B. pmol to $\mu\text{mol/kg}$), furthermore (Metall) Chelatoren (z.B. alpha Hydroxyfettsaeuren, alpha Hydroxypalmitinsaeure, Phytinsaeure, Lactoferrin), alpha Hydroxysaeuren (z.B. Citric acid, lactic acid, malic acid), Huminsaeure, bile acid, Chlorogensaeure, coffee acid, Gallenextrakte, bilirubin, Biliverdin, EDTA, EGTA and their derivatives, unsaturated fatty acids and their derivatives (z.B. gamma Linolensaeure, Linolsaeure, oleic acid), Folsaeure and their derivatives, Ubichinon and Ubichinol of their derivatives, vitamin C and derivatives (z.B. Ascorbylpalmitate, mg - Ascorbylphosphate, Ascorbylacetate), Tocopherole and derivatives (z.B. Vitamin E - acetate), vitamin A and derivatives (vitamin A - palmitat) as well as Koniferylbenzoat the Benzoeharzes, Rutinsaeure and their derivatives, Ferulasaeure and of them Derivatives, Butylhydroxytoluol, Butylhydroxyanisol, Nordihydroguajakharzsaeure, Nordihydroguajarettsaeure, Trihydroxybutyrophenon, uric acid and their derivatives, Zinc and its derivatives (z.B. ZnO, ZnSO₄) selenium and its derivatives (z.B. Selenmethionin), stilbene and their derivatives (z.B. Stilbenoxid, Trans Stilbenoxid) and according to invention suitable the derivatives (salts, esters, Ether, sugar, nucleotides, nucleosides, peptide and lipide) of this mentioned Active substances.

The quantity of the Antioxidantien (one or more connections) into that Preparing preferably amounts to 0.001 to 30 Gew.-%, particularly prefers 0.05 - 20 Gew.-%, in particular 1 - 10 Gew.-%, related to the total weight that Preparation.

It is naturally well-known the specialized man that fastidious cosmetic Preparing mostly not without the usual auxiliary and additives conceivably are. Among them for example consistency givers, fillers, count Parfum, Coloring materials, emulsifying agents, additional active substances such as vitamine or proteins, Light-protective, stabilizers, Insektenrepellentien, alcohol, water, Salts, antimicrobially, proteolytically or keratolytisch effective substances etc..

If it is wished, the water phase of the according to invention can O/W Mikroemulsionen of also thick contain, so that the total preparation appears gel-like and as micro emulsion gel to understand is. As suitable More thickly for example Carrageenan have themselves and/or. PEG-4-Rapeseedamide as well as Laureth-2 amide MEA put out.

According to invention active substances can be selected also very favourably from that Group of the lipophilic active substances, in particular from the following group:

Acetylsalicylic acid, atropine, Azulen, Hydrocortison and its derivatives, z.B. Hydrocortison-17-valerat, vitamine, z.B. Ascorbic acid and their derivatives, Vitamine of B and D-C series, very favorably the vitamin B₁, the vitamin B₁₂ that Vitamin D₁, in addition, Bisabolol, unsaturated fatty acids, in particular those essential fatty acids (often also vitamin F called), in particular those Gamma Linolensaeure, oleic acid, Eicosapentaensaeure, Docosahexaensaeure and of them Derivatives, chloramphenicol, coffein, Prostaglandine, thymol, Campher, excerpts or other products of vegetable and animal origin, z.B. Night candle oil, Borrettschoel or Johannisbeerkernöl, fischöl, Lebertran in addition, cerium amides and cerium-amide-similar connections and so on.

Although naturally also the use of hydrophilic active substances, is a further advantage that is favoured according to invention micro emulsions according to invention that the high number more purify-divided Droplet straight oil-soluble and/or. lipophilic active substances with particularly larger Effectiveness makes biologically available.

Favourably it is also, the active substances from the group of the wax protective To select substances, for example PUR-CELLO oil, Eucerit TM and Neocerit TM.

The preparing according to invention can contain cosmetic auxiliary materials, like it in such preparing to be usually used, z.B. Preservative, bactericidal one, Viruzide, Parfume, substances for preventing the sudsy, coloring materials, pigments, which have coloring effect, Thickener, surface-active substances, emulsifying agents, softening, dampening and/or substances damp-holding, entzündungshemmende Substances, medicines, fats, oils, waxes or other usual components a cosmetic or dermatologischen formulation such as alcohols, Polyole, Polymere one, foam stabilizers, electrolytes, organic solvents.

Mixtures that become in particular favourable solvents managing specified used.

As further components can be used fats, waxes and others natural and synthetic fat bodies, preferably esters of fatty acids also Alcohols of low C-number, z.B. with isopropanol, propylene glycol or Glycerin, or esters of fettalkoholen with alkane acids of low C-number or also Fatty acids, alcohols, Diole or Polyole of low C-number, as well as their ether, preferably ethanol, isopropanol, propylene glycol, Glycerin, ethyl glycol, Ethyl glycol mono ethyl or more monobutylether, propylene glycol mono methyl, - mono ethyl or more monobutylether, Diethylenglykolmonomethyl or more monoethylether and similar products.

The following examples are the available invention to clarify.

Claims OF EP0820758

1. Hair care preparing in form of a transparent or transluzenten Micro emulsion of the type oil in water,

comprehensively an oil phase, and a water phase containing:

one or more polyethoxylierte O/W emulsifying agents and/or
 one or more polypropoxylierte O/W emulsifying agents and/or
 one or more polyethoxylierte and polypropoxylierte O/W emulsifying agents,

gewuenschtenfalls furthermore containing one or more W/O emulsifying agents
 furthermore containing at least a kationisches Tensid, selected from the group the Tenside, which does not possess film-forming characteristics
 an emulsifying agent content smaller than 2.0 Gew.-%, related to the total weight that Emulsion, exhibiting.

2. Use from preparing to requirement 1 for the increase of the hair abundance, to Improvement of the Haarbody and the hair volume as well as the stop that Haartracht.

3. Preparing according to requirement 1 or use according to requirement 2, thereby marked that the oil phase is selected from the group of the Silikonoele, in particular from the group of Phenyltrimethicon, Cyclomethicon (Octamethylcyclotetrasiloxan) Hexamethylcyclotrisiloxan, Polydimethylsiloxan, Poly(methylphenylsiloxan), furthermore from Cyclomethicon and Isotridecylisononanoat, as well as mixtures from Cyclomethicon and 2-Ethylhexylisostearat.

4. Preparing according to requirement 1 or use according to requirement 2, thereby marked that that or the kationischen Tenside is selected from that Group of the quaternaeren ammonium compounds, if this no film-forming Characteristics possess, in particular benzyle dialkyl ammonium chloride or bromide, as for example Benzyldimethylstearylammmoniumchlorid, furthermore Alkyl dialkyl ammonium salts, for example for example Cetyltrimethylammmoniumchlorid or bromide, Alkyldimethylhydroxyethylammmoniumchloride or bromide, Dialkyldimethylammmoniumchloride or bromide, Alkylamidethyltrimethylammmoniumethersulfate, Alkylpyridiniumsalze, for example Lauryl or Cetylpyrimidiniumchlorid, Imidazolinderivate and Connections with a kationischem character such as amine oxides, for example Alkyldimethylaminooxide or Alkylaminoethylaminooxide

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